Freshmen Number

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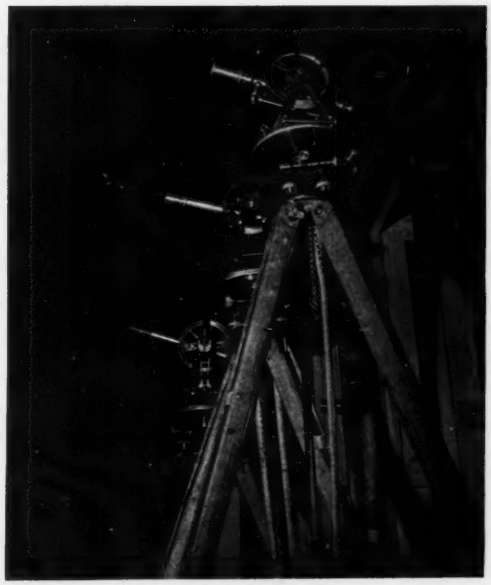
The CORNELL ENGINEER



In This Issue:

DEAN HERMAN DIEDERICHS -- *By C. F. Hirshfeld*

Volume 2 OCTOBER, 1936 Number 1

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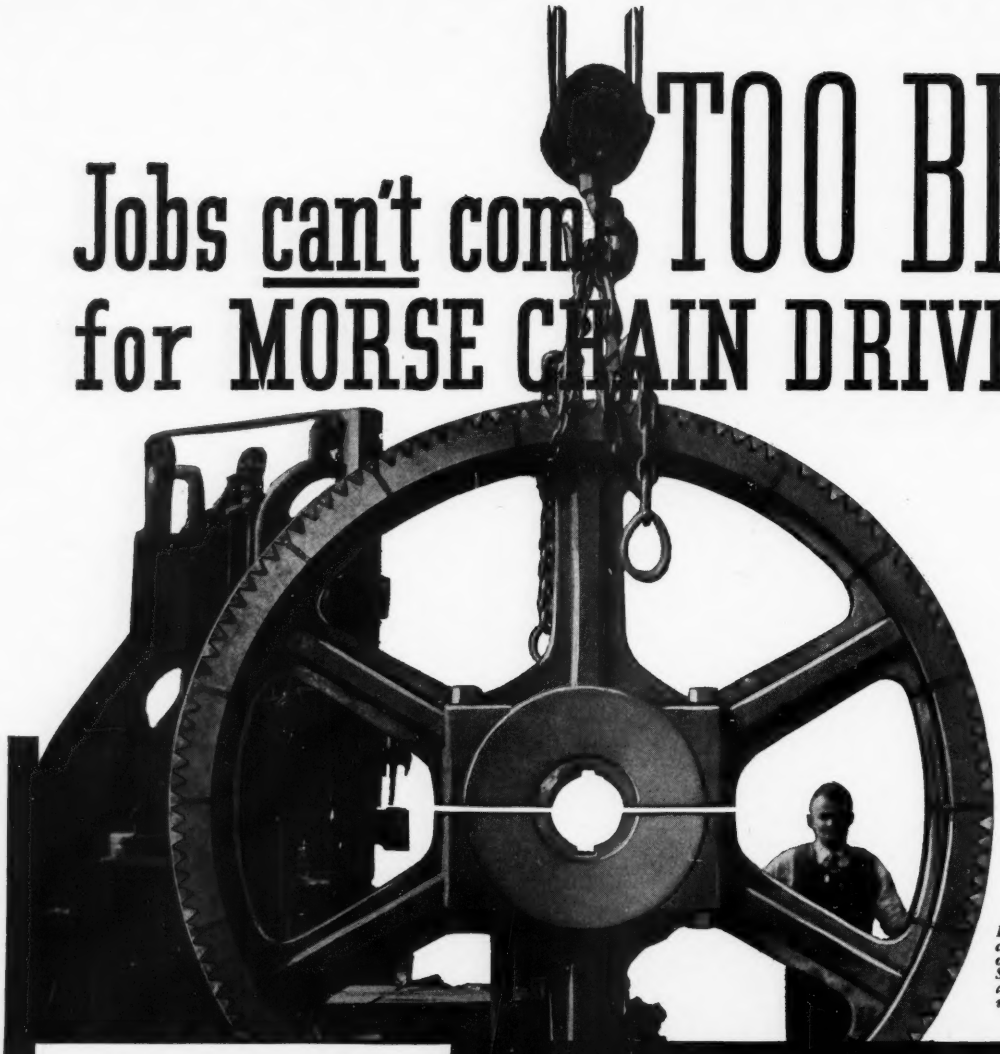

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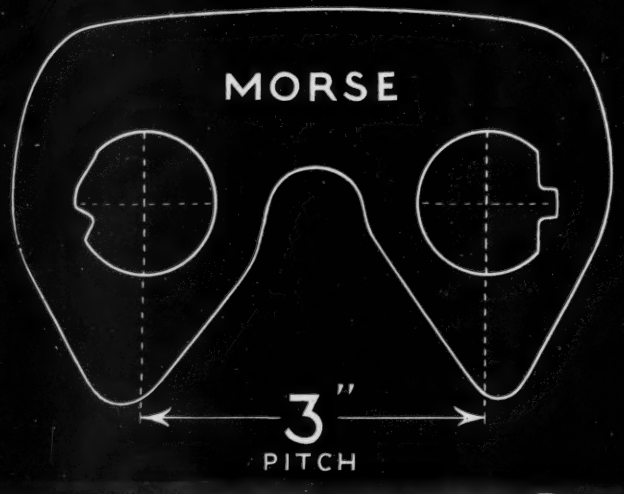

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Volume 2 OCTOBER, 1936 Number 1

COMMENT

If individual issues of magazines were dedicated, this issue would be dedicated to Herman Diederichs, the new Dean of the College of Engineering. Professor C. F. Hirshfeld, '05 MME, however, in his article on Died, has done much more than dedicate. He pays a marvelous tribute to our Dean in the finest article of its type the staff has ever seen.

* * *

F. S. Cleary, '25 ME, '29 MME, Assistant Professor of Machine Design explains, in a new graphical manner, the theory behind the presentation of an entire engineering curriculum. Besides being of interest to the freshmen, the article will refresh the memories of the alumni as to the problems facing the faculty in course organization.

* * *

The article on "Freshmen Information" is not just what the name implies. It is not a list of "do's" or "don't's", but an attempt to inform the freshman as to where he is going, and how to get there.

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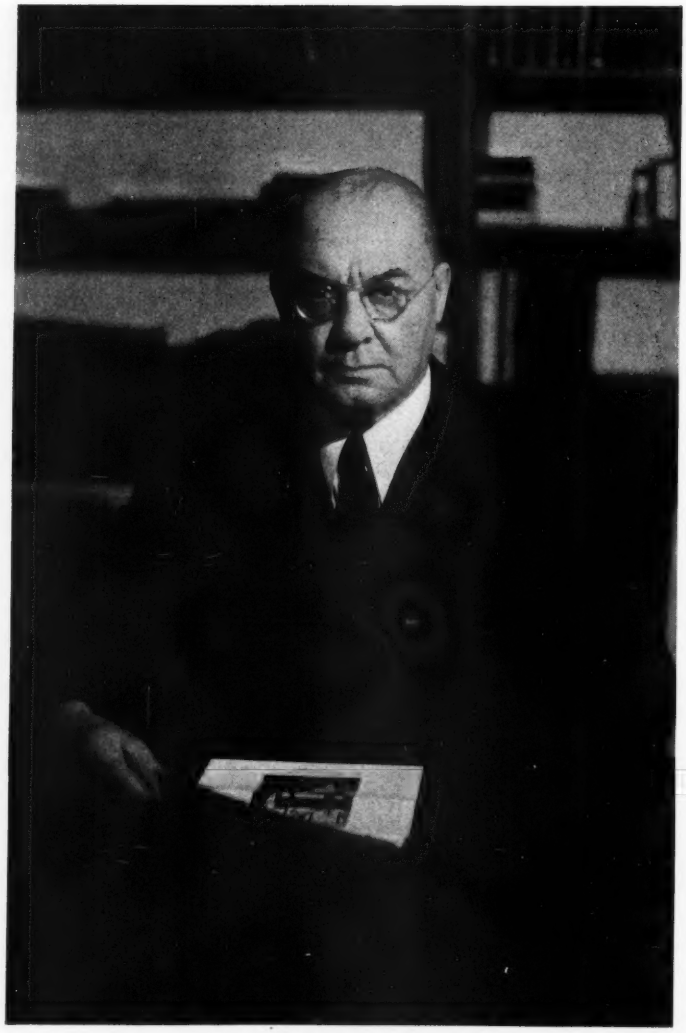


DEAN HERMAN DIEDERICHS

The CORNELL ENGINEER

Vol. II October, 1936 No. 1

DEAN HERMAN DIEDERICHS

By C. F. Hirshfeld, '05 MME

Chief of Research—Detroit Edison Company

Former Professor Heat Power, Cornell University

Try to imagine a fourteen-year-old boy transported from Germany and dropped into this country completely ignorant of its language, ways, customs, and all else of a local nature that you knew so well at that age. Can you visualize the intelligence and perseverance necessary to become oriented, to learn the language, and graduate from high school four years later? Can you appraise the capping of this performance by the winning of a State Scholarship at Cornell by competitive examination and the graduation with honors from Sibley College only nine years after reaching these shores? Such in fact were the early accomplishments of the man officially known as Professor Diederichs, more familiarly called Died, now Dean of the College of Engineering.

Even this remarkable record does not give a complete picture. It happened that Herman Diederichs was the eldest of seven children and that he came of a family of modest means. The comparatively meagre resources had to be spread rather thin. In order to accomplish his ambitious plans it was necessary for the young man to be partly self supporting while at Cornell. And, as if this additional burden were not sufficient, he competed in athletics and became the University's foremost shot-putter.

These early experiences and trials were indeed enough to test the timbre of the boy and of the youth that boy became. Undoubtedly they were effective in developing those inborn traits and in engendering those characteristics which enabled him to continue through many years an active and nationally valuable career in spite of many handicaps and restrictions imposed by the limited means of the organization he served. Herman Diederichs is remarkable as one who started his teaching career in the institution from which he graduated; he continued up the ladder of progress in the same institution until he has now reached the topmost rung of that ladder.

I should like to paint for you a veritable word picture of this man as I see him and know him to be after over thirty years of rather close association. In recent years the undergraduates have been able to see behind the cloak with which he modestly attempts to mask himself, and they have gone far toward discovering the real worth he thus tries to conceal. I know this to be true from remarks made by the young men themselves, and it is amply attested by the fact that the Class of 1935 dedicated *The Cornellian* of that year to him in these words:

"To Herman Diederichs, who for forty-two years has served his Alma Mater as student, teacher, and administrator, and who, through his intense interest and untiring efforts, has succeeded in inaugurating a new era in Cornell athletics. For his active participation in Campus affairs he will long be remembered, and as a stern teacher and a sympathetic, honest friend, the Class of 1935 will revere him—Cornell's Man of the Year."

Many of the older graduates knew him less completely. He appeared to them as a rather brusque individual, a stern disciplinarian, a good teacher, and an athletic fan, but withal as a person that seemed in some peculiar way to hold aloof. In some respects the poorer scholars and the breakers of rules and regulations among the older classes were more fortunate than those who traveled the straight and narrow path of scholarship and good conduct. Many of the weak, the lame, and the mischievous who appeared before Professor Diederichs and his associates, by special though not sought after invitation, discovered that back of the severe manner of the strict disciplinarian there dwelt a kindly, understanding, and human living soul. And many of these individuals acknowledge their debt to this more or less hidden self.

Were I to attempt to catalogue Herman Diederichs' most outstanding qualities I think I should place first his tremendous driving power. It was foreshadowed in the boy and in the youth, as I have already indicated. It has become more and more evident as the years have gone by as the man in his capacity of teacher and administrator has met problem after problem and obstacle after obstacle, only to square more firmly that square chin of his and to pound away until the problem was solved or the difficulty overcome. He has persisted to such an ex-

tent upon occasion that his perseverance was mistaken for obstinacy, but I have noted that in many cases his way was ultimately recognized as the right way and was followed. He is not an obstinate or stubborn individual in the sense of being unwilling to listen to argument or reason. He is an individual who insists on learning the facts, making up his mind as to the proper course of action, and then sticking everlastingly to the task of achieving the desired result.

Possibly I should place second in my catalogue his marked executive and administrative ability. He has gone about the exercise of these talents in so quiet and unobtrusive a way that many observers have overlooked them. That they have been appreciated by some, however, is attested by the numerous important committee appointments he has had both in and outside University circles and by his successful handling of a difficult athletic situation through a comparatively long period of time. And finally we find recognition in a bigger way in his recent appointment to the Deanship.

Those who have worked under him and with him, as I have, recognize the genius of the man in these respects. He has his own peculiar ways of getting results, but he does get them. And he does this without the use of any heavy-fisted methods or other forms of duress. One person he coaxes to accomplishment, another he inspires, another he flatters, another he laughs with and possibly at; the desired end is achieved and subordinates not only regard him as friend and kindly adviser but grow to love him for his simple, intrinsic worth.

I think the third item in my catalogue would be intellectual capacity. There is a fairly well authenticated story that in his younger years he read through the entire *Encyclopedia Britannica.* This may or may not be literally true, but in my contacts with him I have often felt that it ought to be even if it is not. He is in fact a most omnivorous and appreciative reader and always has been. His breadth of knowledge is great although not frequently displayed, and his ability to use such knowledge for both aesthetic and practical ends is remarkable.

Engineering students know him principally as an engineer particularly versed in experimental engineering and in the materials of engineering. As a matter of fact his writings and his works have taken him well over the entire field of mechanical engineering and to some extent outside its borders. Other individuals occasionally discover that he possesses a remarkable knowledge of the facts of history and of their political, social, and economic significance. Still others discover in him a sympathetic understanding and frequently a vast extent of knowledge in their own chosen fields, diverse in character but all appealing to the intellectual rapacity of this man Herman Diederichs.

Next, I believe I might place his love and understanding of people, particularly of boys and young men. He is not a demonstrative person, but if you know him well and have his confidence you can see the play of such emotion and understanding in many of his acts. These characteristics have been active forces throughout his career and explain his success in dealing with people and in obtaining results through people. Although he is not demonstrative, those who work under him understand that he understands.

His success as a teacher probably results largely from his intellectual capacity and his love and understanding of people. But also it is undoubtedly due in part to a real and active sense of humor, which permits him to appreciate the ebullient nature of youth and prevents him from taking either himself or his students too seriously in their teacher-student relationships.

And last, but by no means least, I think I should probably catalogue integrity. I do not use this word in any narrow sense as a rough equivalent of what commonly passes for honesty in this world of ours. I mean by it essential honesty with respect to himself and in his dealings with others. I mean an absolute refusal to fool either himself or others. Herman Diederichs believes in a rigid code and lives up to his belief.

Naturally a person possessed of all these qualities has not gone unhonored on his way. He has had many University appointments outside his work in the College of Engineering. His honorary fraternity memberships are numerous and representative of many different phases of college and teaching life. He has had many consulting engineering connections. He has been elected to leading technical societies and has served on some of their more important committees. The American Society of Mechanical Engineers has honored him with the Melville Medal. But I venture to say that none of these numerous honors and forms of recognition are as dear to his heart as his appointment to the Deanship after so many years of faithful, painstaking, and inspirational service to his Alma Mater.

In my crude and halting way I have tried to convey to you the characteristics and the qualities and the genius of the man I know. That I shall be completely successful is beyond my fondest hopes. But I trust that I may have been able to stir up memories and to add touches which will enable those of you who have passed under him to formulate more perfect interpretations for yourselves.

This, however, is only part of my ambition. I would go further and enlist your active support of Dean Diederichs in the task he is now beginning. To my mind this task is a huge one. For years the circumstances at Cornell have been such that the engineering schools could not acquire equipment of the types and at the rates necessary to keep abreast of progress. For years the teaching staffs of these schools have been severely overloaded because of the practical impossibility of enlarging the pay rolls. To the credit of the loyal members of these faculties be it said that they have continued to do a marvel-

ously good job in spite of these unfortunate circumstances, in many cases at great personal sacrifice in one form or another. Cornell engineers are still in great demand in spite of the tremendous physical and intellectual handicaps under which their education is given them.

Ever since I resigned from the Cornell faculty, I have made it my buiness to maintain a fairly intimate contact with engineering schools and with teachers of engineering throughout this country and in foreign countries. And I have naturally maintained the most intimate contact with the Cornell College of Engineering. Writing personally and on my own responsibility I am convinced that it is now absolutely necessary to lessen in some way or another the limitations I have referred to above, if they cannot be entirely removed. I am convinced that if this is not done neither Dean Diederichs nor any other individual in his place can continue for long the production of engineering graduates capable of maintaining the enviable reputation established by their predecessors.

More and better equipment must come from some place somehow. The members of the faculty must be relieved of some of the heavy teaching and administrative burdens they now carry in order to permit them to devote some time to their own mental, technical, and social advancement and to permit them to devote some time to the advancement of the art or science they teach. Adequate facilities must be provided for research since it is becoming more and more evident that research is the life blood of such institutions.

To my mind The Cornell College of Engineering does not now need monumental buildings nor does it need ornate equipment. It does need the tools of its business and it does need more men capable of handling them and of improving them. It does need those things which will permit a revival of the spirit and activity that made it a leader in engineering research not long ago and that contributed so greatly to the character of the graduate that it turned out.

If you, patient reader, have been sufficiently interested to read this far and if you happen to be a Cornell engineering graduate, I request that you give serious consideration to this situation. Our new Dean is a man so intimately familiar with the history of the institution as to be able to appraise its needs in a unique way. He is capable of accomplishing much even under present conditions, but his accomplishments may be expected to increase in geometrical proportion to the equipment and facilities provided him.

I do not believe you want to see this capacity for achievement bound by shackles that are a natural result of the conditions under which Cornell has had to operate for some time past. These can be removed if we set our minds and hearts to the task.

The Instructional Organization of Engineering Pictured for Freshmen

By F. S. Cleary, '25 ME, '29 MME

Ass't. Professor Machine Design—Cornell University

Each year the Engineering Faculty joins with the Student Body in showering the Freshman Class with warnings of the disaster which inevitably overtakes the student who fails or tarries in the all-important task of developing a manner of living suited to his role as a member of the university community. Information of timely value is broadcast concerning the greater responsibilities which accompany the greater freedom enjoyed by the college student in contrast to the preparatory-school student. The obvious need of substituting self-management for parent-management is pointed out, together with the need of substituting still more self-management for teacher-management; this is less obvious than the first because it is not generally appreciated that the teacher must become less of a driver and more of a leader as education reaches the higher levels. Facts and figures of value to the freshman in the organization of his affairs are presented in the Introductory Lecture Course and by the Class Advisers; these include such items as the rules of the College; the amount of the time to be spent in preparation of assignments, methods of budgeting time on a weekly basis, importance of proper equipment and environment for study, exercise, and recreation, hours of sleep, food, glasses, colds, and other things. In fact, no opportunity is overlooked to impress upon the freshman the idea that he is entering a period of intensive living dedicated to worthwhile ends which can be obtained only through his intelligent and active coöperation with the College.

In spite of these combined efforts to inform the entering student of his responsibilities and to assist him with the task of meeting them, the close of each first term brings its usual crop of scholastically deficient freshmen, most of whom possess the ability to do satisfactory work. Year after year these able but erring freshmen give the same explanations. Some may say, "I didn't get going in time," others, "I didn't know what it was all about at first," still others, "It's such a change from High School." All these explanations add up to essentially the same thing; these students failed to attune their efforts to the system of organized instruction until too late to save themselves.

The truly able freshmen of this group usually buckle down to serious work and eventually graduate with fair

records, but never can they do justice to their abilities nor take full advantage of the opportunities offered by the University unless extra time is spent in repairing their knowledge of those basic subjects which provide the foundation for subsequent study. Too often these freshmen attempt to patch their difficulties by tutoring for make-up examinations and by limping along more or less out of step with the organized curriculum. The ill effects of this patch-up policy may pursue the student through his entire college career, causing unnecessary difficulty with the mastery of required subjects and barring him from desirable supplementary studies and student activities.

Because it is obviously impossible for the freshman to attune his efforts to an unknown or illy understood set of conditions it is imperative that he be provided with a definite picture of the field of engineering as it is organized for the twin purposes of instruction and study.

The first step in developing this picture is to visualize engineering as a field of study which, as it stretches out before the observer, becomes ever broader, because broader fronts and firmer foundations for further study are made available as study progresses. This conception of the engineering field may be graphically represented by a sector of a circle assumed for present purposes to include the whole of human knowledge. The observer stands at the center of the circle and, when looking out over the engineering sector, sees that it overlaps two other sectors; a sector on the left representing the field of science and one on the right representing the field of commerce. See Figure 1.

In order that this picture may serve as a graphic definition of engineering, one must imagine a layer of the Humanities to underlie these fields because Engineering serves the needs of mankind, when commercially justified, through the application of scientific and technical knowledge to the solutions of those problems which fall within its borders.

There is no fixed outer boundary to the field of engineering because engineering must expand with other fields of knowledge. There is an established inner boundary, however, because certain knowledge must be possessed before the field of engineering can be entered. This inner boundary is approached by the student from the center of the circle and is reached when he has satisfied

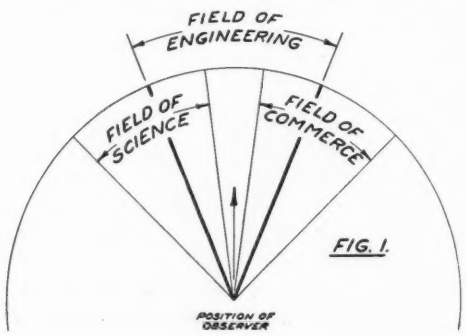


FIG. 1.

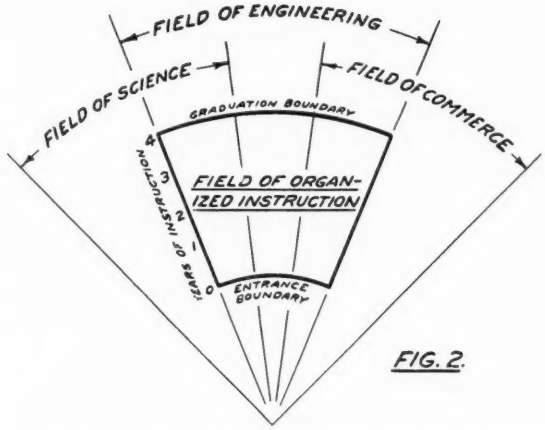


FIG. 2.

prescribed entrance requirements. Entrance requirements are maintained sufficiently broad to serve as a basis of study for the whole sector of engineering and the entrance boundary is established far enough out in the field to permit the entering student to reach the present outer boundary of well organized instruction in engineering by four years of intensive study. Additions of these inner and outer boundaries which define the portion of the engineering field covered by organized instruction bring the picture to the degree of development shown in Figure 2.

Before attempting to develop the picture further it is necessary to devote some attention to an important law which governs instruction and study and also to examine the content of the field of organized instruction.

The law, called the law of prerequisites, has already been encountered at the entrance boundary where it denies admission to those students who fail to possess that fundamental knowledge which forms the basis for successful study in the organized field of instruction. Thus, the purpose of the law is to safe-guard the interests of the student by prohibiting study when, because of inadequate preparation, failure is inevitable. Both study and instruction break down when this law is violated, hence it continues its sway throughout the whole field of organized instruction, governing student and faculty alike in their mutually dependent efforts.

The content of the organized field of instruction consists chiefly of three classes of subject-matter: (1) sciences basic to engineering, (2) engineering technology, i.e., organized knowledge relating expressly to engineering work and, (3) true engineering subjects in each of which basic science and technology is applied to an engineering purpose by means of the special technics of the subject.

It is now possible to show that the law of prerequisites divides the fields of organized instruction into two roughly separate stages, (1) a grounding or primary stage and (2) a specific or secondary stage. At the beginning of the primary stage the law of prerequisites limits instruction to basic sciences and engineering technology, excluding engineering subjects because their prerequisite

science and technology have not been studied. As the stage progresses, sufficient science and technology are studied to satisfy the prerequisites of the more fundamental engineering subjects and instruction in them becomes practicable. The boundary between the two stages is reached when instruction in the engineering subjects begins to dominate the field. This occurs roughly at the beginning of the third year. See Figure 3.

Two study adjustment zones are noted in Figure 3, one at the beginning of each stage of instruction. These are the danger zones of the four-year course.

Many of the reasons for the need of study adjustment in the first zone are mentioned in the opening paragraph of this article; the freshman will receive fuller information of these reasons from other courses. One danger of the first study adjustment zone deserves special attention. It is the danger that confronts the freshman who, through ignorance of the law of prerequisites or the nature of engineering subject-matter, expects to start studies of full-fledged engineering subjects immediately upon admission to the College. This freshman has small taste for the prescribed subjects, does insufficient studying to become truly interested and thus finds the whole primary stage of instruction a disappointment. If he reaches the secondary stage he finds too late that the very opportunities for which he was so impatient are largely lost because he failed to prepare properly for them.

The second study adjustment zone is encountered at the beginning of the secondary stage of instruction where the engineering subjects begin to predominate. The study of these subjects creates a demand for the application of mature thinking and judgment that seems little short of an imposition to students who have developed a sophomoric confidence in their primary-stage study methods. The extent of the difficulties encountered at this time is evinced by the fact that grades reach the lowest level of the four-year course owing largely to the long period of time required by the student for realizing the need for new methods of study and for sensing the nature of the demands that must be met when he finally attempts to devise them. Whatever the difficulties of this period, they

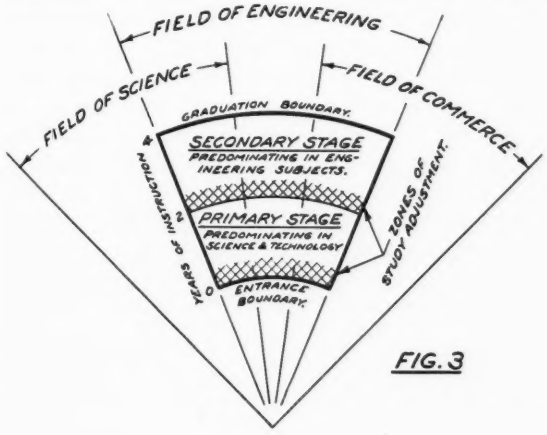


FIG. 3

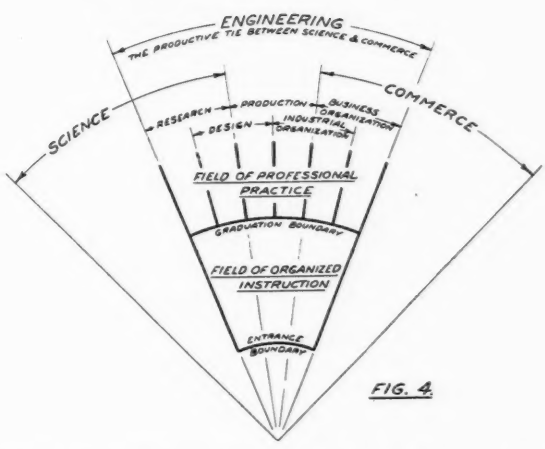


FIG. 4.

should be welcomed rather than dreaded because they mark the beginning of maturity for the engineering student.

At the beginning of the second year of instruction the field of engineering becomes too broad to be covered by a single course of study and the student is thus forced to select one of the several organized courses offered by the College. The work of making this selection may be accomplished in three steps which include the following lesser tasks:

1. The selection of one of the major divisions of engineering: civil engineering, electrical engineering, and mechanical engineering.

2. The selection of a related group of professional activities which are embraced by the chosen major division of engineering and which, in view of student's interests and abilities, offer the broadest and most fertile field for the application of his efforts.

3. The final task of choosing between the Regular Engineering Options which are largely alike until the senior year, and the Administrative Engineering Course which differs sharply from the Regular Options beginning with the sophomore year; the choice being determined by the relative capacities of the courses for providing instruction basic to the professional activities selected in step 2.

Information needed by the student when making these selections is provided by the Introductory Lecture Course of the Freshman year. Here the fields of the three major divisions of engineering are defined, the professional activities of each field are described, and the capacities of the Regular Engineering Options and the Administrative Courses for professional preparation are explained. In spite of the wealth of pertinent information thus provided, some students have little confidence in their ability to make the final choice of a course, largely because they are unable to visualize the relationship between the field of organized instruction and the field of professional practice. Pictures which show this relationship can be

readily developed to suit the individual needs of these students.

The picture, Figure 4, shows the field of professional practice stretching out beyond the field of organized instruction. The graduation boundary of the field of organized instruction is the entrance boundary of the field of practice; thus the purpose of organized instruction is largely that of providing the student with the prerequisites of practice, just as the purpose of preparatory school work was to provide him with the prerequisites of engineering instruction. Since it is impossible to include the prerequisites of the whole field of professional practice in one organized course of instruction, each course is designed to prepare the student for the widest possible range of activities. Only the broader activities of one major division of engineering (Mechanical Engineering) are shown in Figure 4 but the picture serves to illustrate the arrangement of activities within the field. The location of an activity is determined by the relative strength of its ties to science and commerce; thus, Research is at one extreme, in that part of the engineering field which overlaps science; while Business Organization is at the other extreme, in that part of the engineering field that overlaps Commerce. The central activities, Design, Production, and Industrial Organization, are also shown in locations dictated by the strength of their ties to Science and Commerce. The more specialized professional activities may be readily located in the field by associating them with previously located broader activities.

Efficient courses cannot be organized to provide expressly for instruction in the prerequisites of such widely divergent activities as Research and Business Organization, because instruction is most efficient when confined to the related prerequisites of related professional activities. Undesirable narrowing of instruction is avoided in the Organized Course by providing, in addition to complete instruction in the prerequisites of the widest possible

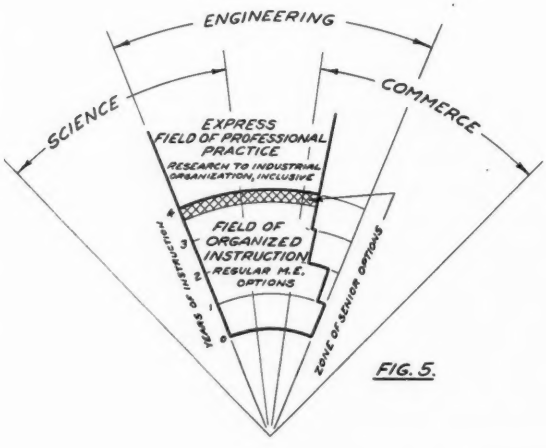


FIG. 5.

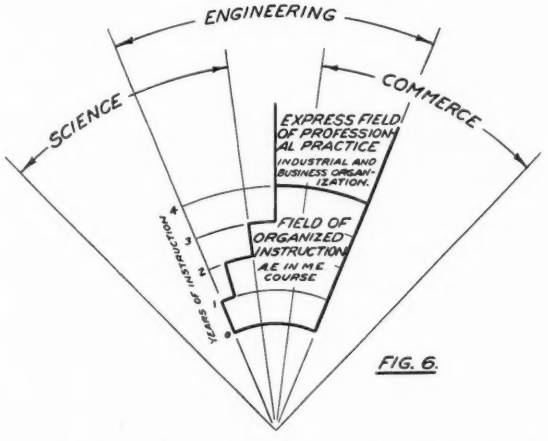


FIG. 6.

sector of the professional field, as much instruction in the balance of the prerequisites of practice as is practicable in view of the increasing load.

After locating the activities of his choice in the field of professional practice the student must investigate the capacities of the Regular Engineering Options and the Administrative Engineering Course to provide instruction in the prerequisites of these activities. The Announcement of the College of Engineering lists the subject matter included by these courses and thereby provides the information necessary for making rough pictures which show the portions of the field of organized instruction covered by each course. Examples of such pictures are shown in Figures 5 and 6, representing respectively the Regular Mechanical Engineering Options and the Administrative Engineering Course in Mechanical Engineering. Figure 5, representing the Regular Mechanical Engineering Options, shows a portion of the senior year, shaded to indicate that all of this portion of the field is available for study but that time will permit only a part of it to be covered. The senior chooses that option from the several available which provides the instruction he desires. Both courses provide for unprescribed (elective) study in the senior year which may be used to complete the prerequisites of additional professional activities or for such other purpose as the student may desire. This elective study is particularly useful to the student who is able to combine it with extra work in either regular or summer session and thus form a coordinated line of supplementary study.

The group of professional activities for which the student desires special preparation is the dominating factor in determining the selection of a course, but careful consideration should also be given to the capacity of the course for providing instruction in the prerequisites of other activities, especially if there is a possibility of further study after graduation.

FRESHMEN INFORMATION

In the fall, each entering freshman feels that he is confronted with numerous problems which are peculiar to his case. After a few terms, however, it is seen that these problems are really few and could have been considerably alleviated by a little timely information. Following, for the class of 1940, is as much of this material as could be gathered by the editors on these various puzzling subjects.

—o—

This Business of Education

Professor S. C. Hollister

Director of the School of Civil Engineering, Cornell University

The newly-arrived student in engineering cannot help being a bit confused and baffled by the complexity of life and events on the campus of a great university. Sooner or later he is conscious of facing the problem of obtaining in full measure an "education," not only in addition to, but even in spite of, the requisite attendance to classes, and the acquisition of passing grades . And with this problem comes another: the crux of the whole matter. What is education? By what set of standards may one judge the values of various suggested and reputed educational opportunities?

At the outset, you may as well know that educators are not at all in agreement on any set of criteria by which one may be adjudged to be educated. But they, and all thinking people, are in general agreement that there are certain major factors involved in acquiring an education. These major factors are fairly easy to state, and are indeed easy of application. By them you will see that a university is not absolutely necessary for obtaining an education; and also, achieving a university course is not in itself a guaranty of acquiring an education.

By the acquisition of many facts or truths or experiences one may not necessarily become educated; he may instead become only learned. But to add to knowledge the ability to think, to develop to the point of habit the mental discipline to think and to act, to cultivate self-control over moral or social behavior, to learn how to discriminate in all matters however obvious or subtle, is indeed to become educated.

It is easy to see that the subject-matter is not the dominant element of an education. One is educated in any profession or vocation, not in terms of the extent of his learning but rather by the extent to which he has trained himself to think and to control his actions and reactions.

Perhaps you were attracted to the engineering profession by the romance of some of its major accomplishments. No doubt you were told, too, that an engineering training would be useful even if you should eventually follow some other profession or vocation, because you would in your training acquire the "engineering method" and the "engineering point of view". This is quite true. Your course in engineering is designed to do two things especially: it groups together for you certain facts and laws of nature and how men can control them to useful purpose for society; and it disciplines you in the process of accurate and orderly reasoning, based upon these facts. Accuracy and thoroughness become habits. The safety of life and property and the administration of moneys involved in your engineering work will depend upon these things. Society will expect them of you as an engineer; and your advancement throughout life will in considerable part be governed by the extent of your development of these habits.

Classes and courses thus become merely the pattern by which learning and education may be acquired. What really counts is the manner in which they are treated and followed. They embrace an essential part of the training of an engineer, but they do not contain all that is necessary. It is quite important that you deal with your courses in a thorough manner, and especially in so doing, that you plan your time to the greatest efficiency, to permit you to pursue other activities which will enhance your knowledge and discipline. Consider your time precious. Choose only those outside activities which contribute to you those educational values I have outlined above.

The head of a large corporation can preserve control only by budgeting income, expenditure, and man-power in advance, and then comparing his monthly reports of performance with the budget. In this way he develops a yard-stick with which to measure the performance each month, and to forecast the trend into future months with some accuracy. This simple plan is readily adapted to your use as a student, and it will surprise both you and your professors with the rise in grades when you learn the habit of doing today's assignment *today*, and of doing the job thoroughly. Your training in the classroom should take first place in your budget. Fix a time each day for doing the tasks of that day thoroughly. It may be hard at first, if you are not used to disciplining yourself; but stick to it, and it will grow easier. Let nothing encroach upon that plan of time. I am not speaking to

you from the point of view of a professor who wants you to do his work first. I am speaking only from the point of view of one concerned with your ultimate goal of success, to show you how the habit of success is broken down into day-by-day accomplishment.

Books have been written on how to study. To study one must concentrate his mental force completely upon the matter at hand. Two things are essential to concentration with least effort: a regularly allotted time of sufficient extent at a time of day when you think clearly; and an ordered quiet place to work.

As you take on outside activities that discipline you in some new way,—and they are not worth your time if they do not do so,—attack them in the same orderly thorough way suggested above for your studies. You may then get as much training from them, though of a different kind, as from your class work. Do not slight any work. To do so is the start on the downward road to mediocrity. To do so is to throw away the chances given you here under exceptional conditions to acquire an education.

PURCHASES

The freshman in the College of Engineering will find that he has many diversified purchases to make before he can begin work. First, the textbooks. Instruction as to just what books to buy is given at registration, but where to buy them and what to pay is another proposition. If it is desired to make an engineering library while at college, buy books such as mathematics, chemistry, physics, and surveying new. It is not necessary to purchase new books for descriptive geometry or hygiene. If on the other hand, the mere temporary use of the books is required, get as many used books as possible. To get used books cheapest, see some friends who have advanced to other years. If this is not feasible, get them at the Co-op or the Triangle bookstore.

In regard to drawing instruments, it is best to have a talk with Prof. Townsend or Mr. Cleary in the drawing department before buying these supplies. They know the best sets for each purpose. It would be unwise for an administrative engineer to spend in the neighborhood of $35 for a set which in all probability would be only slightly used after graduation. A mechanical engineer should get as good a set as possible, if he expects to use it professionally. These instruments do not have to be used until the term has progressed several days, so a freshman need not be in a hurry to purchase a set about which he knows little except that it shines. Many other articles, such as T-squares, drawing boards, and miscellaneous equipment are to be used in the drawing room. All of these may be purchased in one large package from the Co-op or the Triangle. It is advisable to buy them this way, as a considerable saving is made and all the articles are standard.

Your New Slide Rule

By Prof. C. O. Mackey, '26 ME

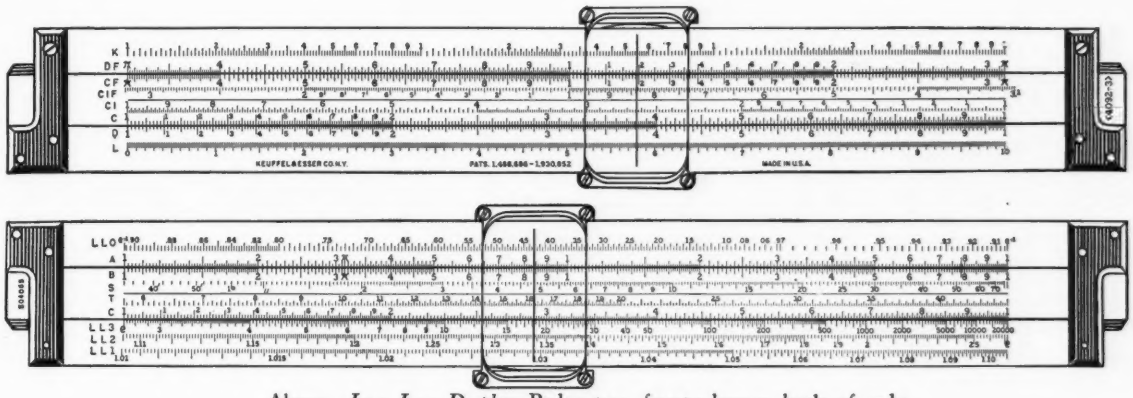
Ass't. Prof. Heat Power Engineering, Cornell University

The student of engineering is easily identified on the Cornell Campus by the slide rule he always carries. Unfortunately, however, the reason this slide rule sometimes solves numerical problems is a thing of mystery to many freshmen. To explain completely the use of a slide rule is not within the scope of this article. However, there are two very important fundamentals that should be understood by every user.

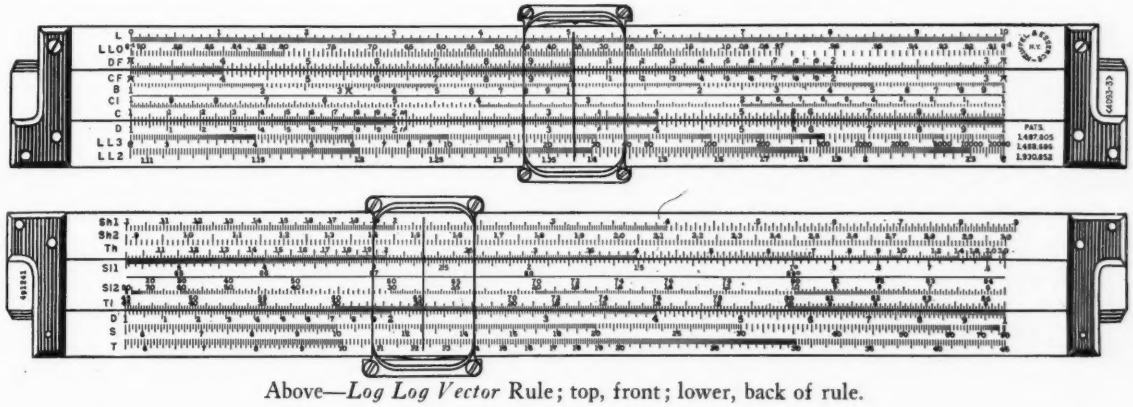
Two scales on the slide rule are sometimes used as stationary adjacent scales. Assume that one scale is laid off from a fixed point as an origin in accordance with the following equation, $x = 2.5\ L$ cm. This scale would be a uniform scale; when $L = O$, $x = O$, when $L = 5$, $x = 12.5$ cm., and when $L = 10$, $x = 25$ cm. Now assume that a second scale is laid off from the same origin, but on the opposite side of the line, with the equation, $y = 25 \log C$. This scale would be a logarithmic scale; when $C = 1$, $y = O$, when $C = 5$, $y = 17.48$ cm., and when $C = 10$, $y = 25$ cm. At any chosen point on the line, x would be equal to y or $0.1\ L = \log C$. In other words, any number appearing on the L scale, when divided by 10, would equal the logarithm of the corresponding number on the C scale. The scales on the slide rule are not laid off along the same line but along parallel lines. With the aid of the glass, however, any two parallel scales may be used as if they were stationary adjacent scales, and this principle is used in finding logarithms, squares, and cubes of numbers, and trigonometric functions of angles.

Again, one scale on the rule may slide relative to an adjacent scale. If both of these scales were uniform, addition, and subtraction could be performed in this manner. If both of these scales were logarithmic, the operation could be used for the addition or subtraction of logarithms—in other words, for multiplication and division. These latter operations are the ones most commonly performed by the user. There are other combinations of sliding scales of lesser importance, but the interested reader might easily devise combinations to solve many different problems. He might decide, for example, what type of sliding scales would give the hypotenuse of a right triangle, if the two legs were known, *etc.*

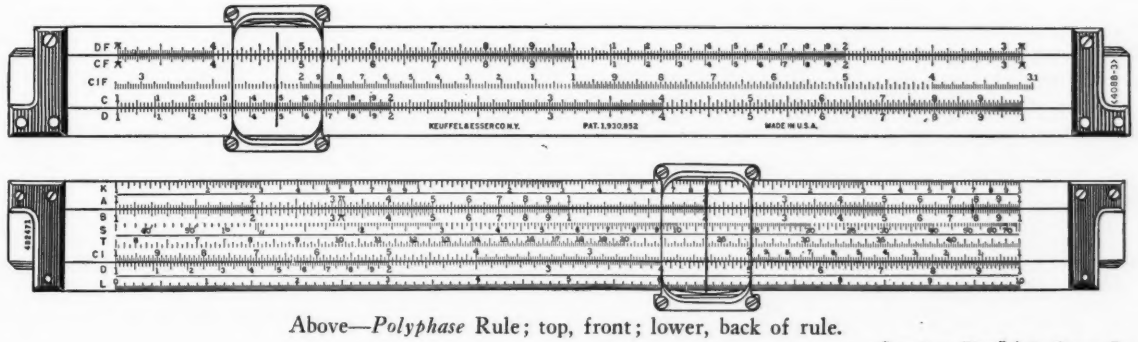
The type of slide rule a freshman should buy depends upon the branch of engineering he intends to study. No engineer should buy a beginner's rule. The slide rule selected by the freshman will, in most cases, be a lifetime possession. The *polyphase* rule will be adequate in most courses taken by the student of *civil engineering,* although a few civil engineers prefer the *log log* rule. Freshman who intend to take the *mechanical engineering* course should purchase the *log log* rule. Students in *electrical engineer-*



Above—*Log Log Duplex* Rule; top, front; lower, back of rule.



Above—*Log Log Vector* Rule; top, front; lower, back of rule.



Above—*Polyphase* Rule; top, front; lower, back of rule.

—*Courtesy Keuffel & Esser Co.*

ing usually prefer the *log log vector* rule, although the *log log* rule may be used in making vector computations.

The face of the slide rule will become dirty with use. Never wash the face with any solvent, such as alcohol; a damp cloth or an art gum eraser should be used to remove dirt from the face of the rule. A little vaseline on the slide may help when accurate settings are required. Never put anything in the slide rule case with the rule that would damage it. Use care in setting the rule and reading the answer; make sure of the major divisions on the rule between which the settings or readings fall. Keep the slides and glass in good adjustment. Put your name on both the rule and the case; the chances are that you will leave your rule in the classroom several times during your course. In particular, don't drop your slide rule on the floor too many times during a lecture—it awakens the students, annoys the lecturer, and doesn't do the rule any good.

COLLEGE

EMPLOYMENT OF ENGINEERING GRADUATES IN 1936

While many of those on the Engineering Faculty familiar with industrial conditions were aware of the fact that things were on the upgrade in industry, few could have foreseen the remarkable upswing that actually took place.

From December 5, 1935 to June 19, 1936, forty-six firms representing widely diversified industries sent representatives to Cornell to interview the men. The list includes many large manufacturing companies, but also shows several steel companies and other firms engaged in producing capital goods, which is a good sign for the continuance of industrial recovery. It is a good sign also that several firms, who during the period of stress discontinued their usual training courses, have again put them into operation. In addition to the forty-six firms sending representatives, forty-five others wrote in asking for information on likely material to suit their needs.

If employment of graduates of the Engineering College is any gage of the state of industry, as it undoubtedly is, the United States appear to be fairly out of the woods.

The following table gives the resulting employment statistics for the graduates of June 1936 as of September 17, 1936:

Course	Total No.	Employed	Graduate Work	Total Employed	Percentage Employed
C.E.	30	23	3	28	93%
M.E.	50	43	6	49	98%
E.E.	28	20	3	24	86%
A.E.	42	40	—	40	95%
Chem. Eng.	7	7	—	7	100%

The forty graduates in Administrative Engineering who found employment, a large percentage (40%) are engaged in going through training or test courses. Others went directly into sales or personnel work, the remainder are engaged in manufacturing.

Of the twenty-eight Civil Engineers only three are taking training courses, while fourteen are engaged in engineering work, eight went into the contracting field, and three are taking graduate work.

Electrical Engineers found other wide fields for their activities. Some found berths with public utility companies. The larger part obtained connections with the two or three outstanding manufacturing firms in this field.

Of the Mechanical Engineers, fifteen are continuing their engineering in training courses. The remainder are widely scattered over a very diversified field. The list includes designing, general engineering, experimental engineering, production work. Six are taking graduate work, either at Cornell or elsewhere.

The small band of Chemical Engineers found ready employment with oil companies, paper manufacturers and large producers of chemical products like the DuPont company. The demand for Chemical Engineers is very active and is likely to continue for some time.

The general outlook of the employment campaign of 1936 has been quite satisfactory and gives hope for increased enrollment in the College of Engineering. The staff members concerned in the work (Professors Bangs, Perry, Chamberlain, Rhodes, and Miss Margaret Komaromi) deserve credit for the way in which this problem has been handled.

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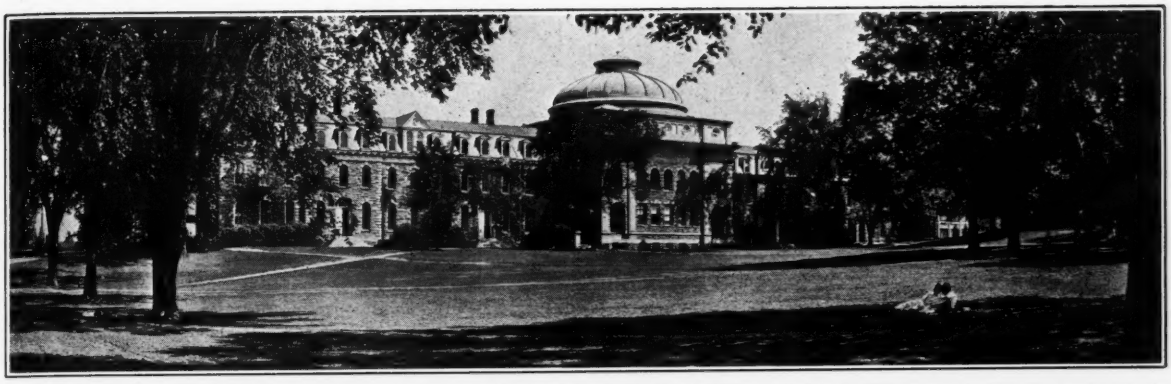
CHANGES IN FACULTY

During the course of the summer, several resignations were accepted from members of the faculty of the College of Engineering. These voluntary departures not only mark the rise of employment in business, but as well offer an opportunity essential to every successful faculty, that of bringing in new blood.

One of the first to tender his resignation was assistant Professor K. D. Wood, '22 ME, of the Mechanics of Engineering Department. For the past term, while



NOTES

he was enjoying his sabbatic leave, Prof. Wood spent his time in San Diego as consulting engineer for the Consolidated Aircraft Corporation. He has now severed all relations here and will remain permanently in San Diego.

Prof. Wood will be remembered for the work he did in the development of the aeronautical courses offered here. He constituted the entire department, organizing the courses, writing several textbooks for use therein, and teaching as well.

Another man to leave the staff was Roland L. Roy, '31 MS, Instructor in Industrial Engineering. Mr. Roy, who only recently transferred from instructing in the Electrical Engineering school, accepted a position with the Palm-Olive Peet Company in Newark, New Jersey. There he will handle industrial organization and time study work.

Dr. Arne Wikstrom, '34 Ph.D., Instructor in Electrical Engineering for the past few years, has also left the faculty. He received an appointment as Assistant Professor of Electrical Engineering at the University of Maryland.

In Lincoln Hall, Earl V. Hawkins, '35 MCE, has been added to the faculty in the position of Instructor of Hydraulics. Mr. Hawkins was graduated from the University of Washington in 1934 and has since done graduate work at Cornell. He is scheduled to receive his Ph.D. in Engineering here in June, 1937.

Another addition to the faculty in the Civil Engineering School is in the person of Professor Wm. E. Stanley who has been appointed Professor of Sanitary Engineering. Since the war he has been a member of the firm of Greely & Hanson, consulting Sanitary Engineers of Chicago, Illinois. Prior to the war, Prof. Stanley was on the faculty of Purdue University. He is a graduate of the University of Kansas, and holds a Master's degree from Purdue.

Appointments to fill the vacancies created by resignation will not be announced until after the trustees' meeting in the later part of September.

TAU BETA PI CONVENTION

Tau Beta Pi will hold its annual convention this Fall at Syracuse and Cornell. The convention will be at Ithaca October 9 and 10. Highlights of the Convention will be addresses by President Farrand and Dean Diederichs. Also there will be inspection trips to the Morse Chain Works, Dixie Cement Plant, salt mines, Ithaca Gun Works, and the Corona Typewriter Co. Outstanding events in the regular convention program will be the formal ball and the banquet. Both of these will be in Willard Straight Hall, convention headquarters.

The Cornell Chapter will be assisted as hosts to the convention by David C. Amsler, M.E. '36, last year's chapter president, who is in school this fall doing graduate work under a Tau Beta Pi Fellowship.

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EXPERIMENTAL WORK

During the past school year and the past two summers experimental studies have been carried on in the Sanitary Engineering laboratory by Prof. C. L. Walker and by Prof. W. L. Malcolm of Queens University, Kingston, Ontario, in partial fulfillment of the requirements for the degree of Ph.D.

Studies with Activated Carbon

With the coöperation of the Industrial Chemical Sales Company and the City of Ithaca, studies have been made to determine what effect the addition of varying amounts of activated carbon has upon the quantity and the quality of the gas produced in the digestion of sewage sludge, and the drainability of the resulting sludges.

Three series of five-gallon digesters controlled at temperatures of 20°C, 28°C and 45°C respectively, the sludge digestion tank of the City of Ithaca sewage treatment plant, and four fifty-five gallon experimental digestion tanks have been employed in the conduct of the work. It is expected that the work now in progress will be completed by the end of November.

(*Continued on page twenty-one*)

THE CORNELL ENGINEER

PUBLISHED MONTHLY DURING THE COLLEGE YEAR

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❖ EDITORIALS ❖

FOR FRESHMEN

The CORNELL ENGINEER extends its greetings to those men of the class of 1940 who have chosen engineering for their life profession. Each year a new class enters to carry on in the footsteps of the preceding classes, classes which have brought much honor to the University. Cornell is today one of the foremost colleges for engineering in the world. This rating has not been achieved without a great deal of hard work. Now that she has attained this position, she will not yield it. Her reputation was gained not alone because of the faculty, the buildings, and equipment, but also by the men who have been sent into the field. On her men Cornell stakes her reputation. It is not surprising that the standards for these men have been kept high. To be graduated from Cornell today, one must have met every standard fully and in such a manner that the University has nothing to fear when he goes forth.

We do not mean by this, however, that there is all work and no play at Cornell. The engineer must not spend all of his time over books. He must broaden the scope of his activities and take interest in student organizations. Sports, publications, clubs, and many other activities are offered here. Each student will find some extra-curricular activity to his taste. To be well rounded, to be better fitted for life and the position it will hold for him, the student should associate himself with others and keep in touch with the activities of the world.

Finally, we wish to speak concerning the faculty of the College of Engineering. These men are here for but one purpose: that is to train you, in four short years, for the remainder of your life. They have devoted a great portion of their lives to this purpose. Therefore they want you to come to them with your problems. They realize that often points are missed in the classroom and in lectures, or that some misunderstanding lodges in the student's mind. The first man to see about these difficulties is your instructor. He will gladly explain, to the limit of his ability, any point that arises. In the College of Engineering the faculty and the students become friends, for they realize that only through working together can they accomplish their tasks. So consider these men your friends.

With these few words, we again bid you welcome, Class of 1940—Cornellians!

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POLICY

The May 1936 issue of the CORNELL ENGINEER carried in the Correspondence Column a letter condemning the policy of tutoring as practiced at Cornell. Written by a student now graduated, this letter did not carry the spirit of the staff of the publication. The letter was unedited, published as received, and the ENGINEER makes no excuses. We wish to point out, however, that this is no student gripe publication, and hereinafter our policy will be to publish only items believed to be a general consensus of student opinion. This does not mean that letters from students are not welcome; but we will not give importance to individual petty grievances by publication in this magazine.

Criticism is always welcome, but there are two types: constructive and destructive. Small is the man who uses the latter. He well deserves the title of "rabid," which he invariably draws upon himself. Practical constructive criticism, even though it be radical, is not rabid, and it it is gratefully received. To promote this type of criti-

cism, and to help improve our school the CORNELL ENGINEER will place suggestion boxes throughout the college of Engineering where interested students may contribute their ideas for the betterment of any situation. We believe this to be a fair way to give voice to the student body and to help eliminate undercurrents of ill-feeling.

While this plan applies to the school as a whole, do not fail to remember that the CORNELL ENGINEER is a part of the school: a student publication, run by students, for students, faculty, and alumni. That the office is on the campus is apt to cause the staff to lean editorially toward petty campus problems. This it strives to avoid. Above all else, it welcomes criticism of both the publication itself and the staff management. Should either disagree with the student body, fairness demands a hearing.

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THE SIBLEY LIBRARY

Nearly all of the upperclassmen of the engineering school are well acquainted with the Sibley Library and fully aware of the benefits derived from normal use of the library's facilities. The engineering freshman, however, often remains ignorant of these facts till late in the year, at which time he wishes that he might have known more about it before.

The Sibley Library, which is located in the Sibley Dome, is open to all students during all school hours. It contains a large number of technical and semi-technical books embracing every engineering subject in which the average student might be interested. In addition to these text and reference books, there are encyclopedias, industrial indices, and an extremely varied and complete collection of the current issues of technical magazines. It is doubtful that a student, who is specializing or interested in a particular branch of engineering, would be unable to find a publication which could give him the latest news and developments that are taking place in that field.

The student who uses the library at regular intervals will find that the time spent is well worth the temporary departure from his textbooks and lecture notes.

Reprint from the January, 1932 *Sibley Journal of Engineering.*

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EDITORIALS

It can be safely prophesied that more heart-felt enthusiasm and sincerity is put into a person's attempts at editorial writing than is expended in any other type of writing. Along with this it is discouraging to concede that appreciation of the worth of editorials and response to their recommendations is slow and half-hearted at its best.

One of the principal reasons which might be advanced as a cause of this is the frequency of repetition of the topics of editorials. This apparent weakness must be granted. It is true that dissertations upon such topics as: balancing extra-curricular activities, cultural development for engineers, maintaining a high scholastic rating, etc., are likely to be repeated during a year, and if not, some of them are bound to creep into the succeeding year's issues. But is this an indication of weakness?

To the contrary, it is a distinct sign of strength. Such statements are fundamental truths which stand unshaken by attempts to disprove or discredit them. Unfortunately there are many who either sneer at them or maintain an attitude of bored indifference toward them. In addition to this class of student, there are those who will grant their value but have never personally encountered situations involving them. Then certain incidents occur which suddenly "bring home" to these men the latent power in those often repeated, differently worded statements. If such a person is connected with a publication, the probable outcome will be another editorial. This person puts into that editorial the best of his writing ability and backs it up with a whole-heartedness that is very rarely behind any other of his literary endeavors. He knows others have heard the same story before; he, himself, has heard it before; but his first real understanding of it has just come and he sincerely tries to carry it to others.

We do not claim that all editorials are written in this spirit, for such a statement would be absolutely false. A fair percentage of them are, however, conscientious attempts to help one's fellow students. They are not lectures. They are not "dont's," nor "do's", but recommendations which if followed by their readers will lead them to the same conclusion.

Reprint from the October, 1931, *Sibley Journal of Engineering.*

Correspondence

Editor,
The CORNELL ENGINEER

Dear Sir:

An admirer of Dexter S. Kimball, I am pleased by your leading article in the issue of May, 1936.

You neglected, however, to bring out a fact that is most significant of the kind of man Dean Kimball always has been. The article says, " . . . born . . . 1865 . . " and "entered Stanford University in 1893 . . ." How many men, even in these days, possess the intestinal fortitude to wade into a University course at the age of 28?

I hope someone will write the whole story of Dean Kimball before he has to pass on.

Cordially,
KARL W. GASS '12

CORNELL SOCIETY *of* ENGINEERS

EDWARD C. M. STAHL '13, PRESIDENT

J. D. TULLER '09, VICE PRESIDENT — S. C. HOLLISTER, VICE PRESIDENT

EDWARD B. KIRBY '25, RECORDING SECRETARY — JOHN P. SYME '26, SECRETARY AND TREASURER

"The objects of this Society are to promote the Welfare of the College of Engineering at Cornell University, its graduates and former students and to establish a closer relationship between the college and the alumni."

President's Column

Fellow Engineers,

The first volume of THE CORNELL ENGINEER, published last school year, recorded a number of significant and far-reaching changes with respect both to our Society and to our Engineering College. This second volume will also include records of important advances both in the Society and in our College.

At the coming annual meeting of The Cornell Society of Engineers, which will be held early in October, a new constitution will be submitted for adoption. The principal changes from the present constitution proposed are (1) regional sections will be recognized so that official representation may be exercised throughout the country, (2) only persons paying the nominal dues will be considered as regular members of the Society, and (3) the Society's administrative year will be changed to coincide with the school year and consequently the publication year of this magazine. The last change will avoid the overlapping of a number of conflicting situations which have proven impractical to adjust under our staggered time schedules.

The administrative officers under the new constitution will be elected at an annual meeting to be held in the Spring. The officers to be elected at the coming annual meeting in October will hold office only until the end of the 1936-37 school year, so that by next June we shall be in full stride with all of the major adjustments completed.

Alumni interest, while it may be very real individually, is elusive collectively. Your society through the medium of this magazine and through group meetings hopes to stimulate and coördinate the widespread alumni interest in and loyalty to our Engineering College. During the last few years the general economic situation naturally affected conditions in Ithaca, but sacrifice and tenacity of purpose on the part of faculty and student body maintained Cornell's position in Engineering Education.

Our large body of 14,000 engineering alumni can be a most potent influence in promoting continued encouragement to faculty, graduate students, and undergraduates in the present-day highly competitive tasks of maintaining their position in the scholastic and professional world. It is surprising to what extent the older graduates of some universities cöoperate with their faculties and more recent alumni. With the organization last year of the McMullen Regional Scholarship Boards, and a few years ago the sub-freshman trips to Ithaca, we have made a fine start in providing good material for matriculation. However, alumni effort should also be expended on advice, assistance, and encouragement to recent graduates. We hope that one of the developments of the regional groups will be that the younger graduates may become intimately acquainted with older alumni and that mutual attachments resulting in true friendship and helpfulness will obtain. These suggestions seem so obvious that it appears unnecessary to discuss them, but the truth is that in general nothing much is being done or accomplished.

Our alumni must become truly Cornell conscious in their daily activities and think of Cornell when employment problems, research investigations, consultations or business activity require active attention. We cannot ignore our common heritage and still claim the reflected glory of our traditions. There are many concrete ways of expressing individual acknowledgement of the obligations that go with the pride of being a Cornellian. A good beginning can be made through joining with the several thousand engineers who have carried on through the Cornell Society of Engineers. Now that our College is issuing only one magazine, more incentive to joint action or individual comment or suggestion is available. By being a member of this Society you not only support concerted and necessary alumni programs for the mutual welfare of the College and its alumni, but you also enlarge the circulation of your College magazine, which is a direct material benefit to the College and in turn enhances materially the value of the objective of undergraduate competition for membership on the Board.

Please think over these matters and talk to your Cornell friends about them.

Sincerely,

EDWARD C. M. STAHL, *President*

While '17 waited, '37 talks

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2. Six-Year course leading to the degrees of Bachelor of Arts and Electrical Engineer.
3. Four-Year course in Administrative Engineering in Electrical Engineering, leading to the degree of Bachelor of Science in Administrative Engineering.

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1. Five-Year course leading to the degrees of Bachelor of Chemistry and Chemical Engineer.

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Facilities are available for conducting fundamental and industrial researches in the foregoing fields in coöperation with industries.

For Detailed Information, Address
The Dean of the College of Engineering, Cornell University
Ithaca, New York

School Notes

(*Continued from page fifteen*)

A preliminary report on this work was presented by Prof. Walker as a paper at the June meeting of the New York State Sewage Works Association held at the Lido Beach Club House, Long Island, N. Y.

Studies on the Digestion of Ground Garbage and on the Effect of Ferric Chloride on the Digestion of Sludge By Prof. W. L. Malcolm

The disposal of garbage has been under review by sanitary engineers in recent years. Some advocate that garbage be ground and washed into the sewers, where later it will be taken care of by the sewage disposal plant. With a view to determining the effect of ground garbage on separate digestion tanks, digestion drums (55 gallon capacity) have been set up in the sanitary laboratory—five (5) pairs of tanks being used. Observation is made on digestion of raw sludge, and of garbage, alone, and garbage and raw sludge in three different proportions, 1 to 1½, 1 to 2, 1 to 1—the first figure representing the sludge volatile content and the latter the garbage volatiles. These experiments were first conducted in 1935 and will be completed during September, 1936.

A further investigation was started this year on the effect of ferric chloride on the digestion of sludge such as we would have in the chemical precipitation process followed by separate sludge digestion to obtain gas for heating and power purposes. This investigation consists of three pairs of tanks. One pair is operated on raw sludge for "control" and the other two pairs are operated with the same amount of sludge but with different proportions of ferric chloride added. Every three weeks the amount of ferric chloride added to the tanks is doubled. One pair of these received twice that of the other. The experiment will continue until the chemical, acting as a bactericide, inhibits further action.

—o—

SIGMA XI CONVENTION

Sigma Xi, national honorary scientific society, held a convention at Ithaca, June 19 and 20, in celebration of the fiftieth anniversary of its founding at Cornell. The program was also sponsored by the American Association for the Advancement of Science. A feature of the meeting was the dedication of the Sigma Xi memorial bench in front of west Sibley.

Prominent speakers were: Dr. Max Mason, retired President of the Rockefeller Foundation; Dr. Karl T. Compton, President of the Massachusetts Institute of Technology; Dr. Willis R. Whitney, of the General Electric Company; and Dr. Frank R. Lillie, of the University of Chicago.

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Alumni Notes

'90, '91 CE—Herbert Parsons died March 18, 1936, in Chicago, Ill., where he retired February 1, 1936, after twenty-five years' service as civil engineer with Argo Corn Products Refining Company.

'92 CE—Colonel William G. Atwood was elected to the board of managers of the Empire State Society of the Sons of the American Revolution at their annual meeting in New York City, April 23.

'94 ME—William G. Kranz has moved his residence from 12608 Cedar Road to 2330 Roxboro Road, Cleveland Heights, Ohio. His business address is 10600 Quincy Avenue, Cleveland.

'11 ME—Edgar MacNaughton is Professor of Mechanical Engineering and in charge of the department at Tufts College. He visited England, Scotland, and Paris last year. His address is 162 Curtis Street, West Somerville, Mass.

'13 ME—W. Roy Manny, sailing Blue Eagle, was sixth in Class X in the first of the season's dinghy races off Larchmont Yacht Club, April 18.

'14 ME—Edward F. Watson is an engineer for the Bell Telephone Laboratories. He has been elected mayor of Larchmont, where he lives at 15 Sound View Drive.

'15, '16 CE—Major Gerald E. Brower, Air Corps, USA, writes to Weyland Pfeiffer, '16 Class secretary: "Returned from the Philippines via Suez and Europe last summer. Hated to come back to the United States, as I became a confirmed 'sunshiner' and could spend the rest of my life in the tropics without a regret. Met a number of Cornellians in the Orient—all doing well. Am just finishing a year's course of instruction at the Command and General Staff School here (Fort Leavenworth, Kan.) Graduate June 19 am ordered to duty next in the office of the Chief of Air Corps in Washington, D. C." His address in Washington will be c|o Office of Chief of Air Corps, Munitions Building.

'16 ME; '01 AB, '03 LLB—Lenox R. Lohr '16, president of the National Broadcasting Company, spoke at a luncheon of the Women's National Radio Committee April 22, at which awards for the five programs adjudged best of the year were announced. He attended the Gridiron Club dinner and show in Washington, April 17, as did George D. Crofts, '01, of Buffalo.

'16 BS, '18 ME—Louis A. Zimm was tranferred last year from Norfolk, Va., to Boston, Mass., where he is district sales manager of the Atlantic Creosoting Company, 10 High Street. He reports the birth of a daughter, Muriel Louise, on March 8.

'24 CE—Ithaca city engineer Harry W. Eustance has been appointed a member of the Flood Control Council of Central-Southern New York.

'24, '25 CE—Frederick W. Colucci married Frieda George of Ithaca May 9. They will live in East Orange, N. J., where Colucci is connected with the Standard Oil Company of New Jersey.

'24 AB, '26 CE—Former Editor-in-Chief of the "Cornell Civil Engineer" Charles U. Strong is with the United Elec. Coal Companies at Chicago, Ill., as Engineer-in-charge of installing systems of cost accounting and operating records.

'28 CE; '30 AB—Granget L. Kammerer and Mrs. Kammerer, (Edna Schoonover) '30 have a son, Henry Granget, born January 17. They live at 23 Edward Street, Baldwin, Long Island. Kammerer is with the New York Telephone Company in Hempstead.

'29 CE—J. Kenneth Hall and Mrs. Hall, who was Mary Farrand, daughter of President and Mrs. Livingston Farrand, have a daughter, Natalie Farrand Hall, born May 12 in New York City.

'29 ME—Theodore C. Ohart is a commercial engineer, working on high-wattage incandescent lamps, including airport floodlights, airway beacons, spotlights, floodlights, etc., in the Special Lamp Bureau of the General Electric Company at Nela Park, Cleveland, Ohio. His address is 902 Caledonia Avenue, Cleveland Heights, Ohio.

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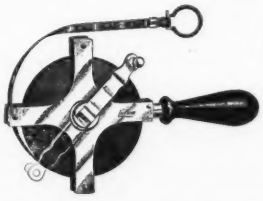

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Alumni Notes

'34 CE—Edward J. Slezak is a chief of party with the Park Dept. of New York City. His residence is 324 E. 6th St.

'34 ME—L. A. Moritz is a Safety Engineer inspecting factories for the Liberty Mutual Insurance Co., of New York City. His home is at 320 River St., Hoboken, N. J.

'34 ME—E. A. Spencer is working on the development of a new process for the Corning Glass Works. His address is 515 W. Fourth St., Corning, N. Y.

'34 ME—E. C. Sulzman is doing field engineering in the Installation Department of the Wright Aeronautical Corp., of Paterson, N. J. He lives at 332 Halsted St., East Orange, N. J.

'34 ME—R. D. West is in the Sales Engineering division doing preliminary design work for the Manitowac Shipbuilding Corp., Manitowac, Wis. His address is 1404 Michigan Ave., Manitowac.

'35 ME—G. R. Ashton is working as a draftsman at Babcock and Wilcox, Barberton, Ohio.

'35 ME—C. T. Blake is serving an apprenticeship of one year with Warner and Swazey Co., before entering the engineering department.

'35 ME—C. D. Bliss is a research engineer at the Air Reduction Co., Inc. He may be reached at 25 Belden Ave., Dobbs Ferry, N. Y.

'35 ME—T. D. Bowes, Jr., is a draftsman for the Winton Engineering Co. of Cleveland, Ohio.

'35 ME—R. S. Birvie is working on the development of a new Diesel engine as an assistant research engineer with the Buda Co.

'35 ME—J. S. Brown, Jr., is a junior engineer with the Frigidaire Co., of Dayton, Ohio.

'35 M.E.—F. R. MacFayden, Jr., is a designer for the Timken Roller Bearing Co., of Canton, Ohio.

'35 M. E.—P. Penton is a designer of heavy duty machine tools at the Niagara Machine and Tool Co., Buffalo, N. Y.

'35 M. E.—R. H. Ritchings is taking a graduate course at M.I.T. and at the same time is doing cooperative work with the General Electric Co.

'35 A. E.—H. C. Bostwick is doing maintenance and repair work for Spencer Kellogg and Sons, of Edgewood, N. J.

'35 A. E.—R. W. Dean has a position directly under the plant manager in the Niagara Machine and Tool Co., of Buffalo. He may be reached at 179 Pratt St., East Aurora, N. Y.

'35 A. E.—R. A. Pfeil is testing electrical apparatus at the General Electric Co. plant in Schenectady. He is living at 27 Snowden Ave, Schenectady.

Stress & Strain

Why Locomotives Are Called She

They wear jackets with yokes, pins, shields, and stays. They have aprons and laps too. Not only do they have shoes, but have short pumps and even hose while they drag trains behind them.

They also attract attention with puffs and mufflers and sometimes they refuse to work. At such times they need to be switched. They need guiding and require a man to feed them. They all smoke, and are much steadier when they are hooked up.—*N.Y.U. Tech.*

A young man by the name of C. H. Fore was arrested recently in Los Angeles on a charge of intoxication. Almost every chemistry student will recognize CH as one of the saturated series.—*Midwest Review.*

First: Has he really a magnetic personality?
Second: Certainly, every thing he has is charged.
— *Penn Triangle*

Stude: Where do these large rocks come from?
Prof: The glaciers brought them down.
Stude: Where are the glaciers now?
Tired Prof: They've gone back after more rocks.
—*Ohio State Engineer*

Pity the poor professor who received the following question. Student: "Sir, there is one thing that is puzzling me. If you square a negative number you get a positive number. If you cube a negative number you get a negative number. But what will you get if you raise it to the two and one-half power?—*N.Y.U. Quadrangle*

The latest definition of a bolt and nut: A bolt is a thing like a stick of hard metal, such as iron, with a square bunch on one end and a long scratch wound around the other end. A nut is similar to a bolt just the opposite, being a hole in a chunk of iron sawed off short with wrinkles around the inside.—*Ohio State Engineer.*

"Are you a college man?"
"No, a horse stepped on my hat."—*The Beehive.*

And then there was the bank president who rushed into the bank looking for the cashier, only to find that the cashier was not at his window. When inquiring as to his whereabouts, he was told that said cashier was at the races. "Gone to the races in business hours?" cried the president.

"Yes, sir, it's his last chance of making the books balance."

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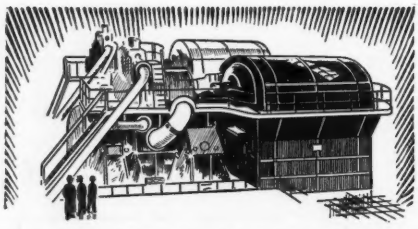

BIGGER AND BETTER TURBINES

The new 110,000-kilowatt turbine-generator, built by General Electric and recently placed in service in the River Rouge plant of the Ford Motor Company, sets several new records in turbine construction.

It is the first large unit in the world to operate at 1200 pounds pressure and at 900 Fahrenheit. Although the weight is approximately 2,000,000 pounds, it is so compact that it occupies less than a cubic foot for each kilowatt of output. Because of its extremely high efficiency, less than a pound of coal is needed to generate a kilowatt-hour of electric energy.

The new turbine is a vertical compound machine with the high-pressure turbine and generator mounted directly above the low-pressure unit. Superheated steam enters the upper unit at 12 pounds and 900 degrees. After producing 55,000 kilowatts, the steam flows directly into the low-pressure unit where it produces another 55,000 kilowatts before it is exhausted to the condenser. This is the first 1200-pound turbine in which the steam enters the low-pressure stage without reheating.

The work of designing, constructing, testing, and installing great turbines, such as this, is the accomplishment of hundreds of graduates of technical colleges and universities—men who are also graduates of the G-E Test.

ELECTRIC HEAT FOR SOILLESS GARDENS

California nurserymen are growing tomatoes, strawberries, and sweet peas in chemically treated water heated by electricity. The method, developed by Dr. W. F. Gericke, of the University of California, has been extended to commercial installations. Tomato plants, grown in this way, produced unusually high-quality tomatoes. The yield was large, and they matured ahead of tomatoes grown in soil. Nourishment for the plants is provided by special chemicals dissolved in the water. Because the water temperature must be accurately maintained, a controllable heat source is required, and General Electric engineers have supplied heating cable and thermostats both for the experimental installation and for commercial installations which have followed.

COFFIN FELLOWSHIPS

This fall eight young men will be carrying on advanced research in seven American universities under fellowship grants from the Charles A. Coffin Foundation. The recipients and their research problems:

George E. Boyd, U. of Chicago '33. At Chicago. Study of surface energies.

Lyman R. Fink, U. of California '33. At California. Phenomena in synchronous machines. Second grant of fellowship.

Alvin H. Howell, U. of Kansas '29. At M.I.T. Insulation problems in d-c transmission.

Russell A. Nielsen, Stanford '33. At Stanford. Electron mobilities.

Richard W. Porter, U. of Kansas '34. At Yale. Transients in the monocyclic network. Second grant.

Julian S. Schwinger, Columbia '36. At Columbia. Theoretical investigations in nuclear physics.

Chauncey Starr, R.P.I. '32. At Harvard. The pressure coefficient of thermal conductivity. Second grant.

Harold G. Vogt, U. of Buffalo '31. At Harvard. The nature of the neutron.

Since 1922, when the General Electric Company established the Charles A. Coffin Foundation in honor of the Company's first president, 113 fellowships have been awarded for advanced work in electricity, physics, and physical chemistry.

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